



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

Handwritten signature

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/973,306	04/10/1998	MATS LEIJON	70563-2/8245	6735

25269 7590 03/24/2004

DYKEMA GOSSETT PLLC
FRANKLIN SQUARE, THIRD FLOOR WEST
1300 I STREET, NW
WASHINGTON, DC 20005

EXAMINER

MULLINS, BURTON S

ART UNIT	PAPER NUMBER
----------	--------------

2834

DATE MAILED: 03/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

08/973,306

Applicant(s)

LEIJON ET AL.

Examiner

Burton S. Mullins

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9,12-29,31-52,54 and 55 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-7,9,12-16,19-26,28,29,31-34,38-52 and 54 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 8,17,18,27,35-37 and 55 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 April 1998 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) n/a. 6) ☐ Other: _____

DETAILED ACTION

Suspension

1. Pursuant to the Board of Appeal's final decision regarding U.S. Application No. 08/973,019, suspension has been lifted. As set forth in the decision on petition requesting suspension, the instant application was granted a suspension pending the decision on appeal of the '019 application. On November 27, 2002, the Board affirmed the rejection of the '019 application and on August 27, 2003, the Board denied applicant's request for reconsideration, thus terminating prosecution of the '019 application. An action on the merits follows.

Drawings

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “*said conductor including a plurality of insulated conductive strands and at least one uninsulated conductive strand in contact with the cover*” (claim 42) and “*said conductor including at least one of a plurality of insulated conductive elements and at least one uninsulated conductive element in contact with the cover*” (claim 55) must be shown or the feature(s) canceled from the claim(s). Fig.3 shows strands 22, but does not show or differentiate insulated and uninsulated strands, the latter being in contact with the cover. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claim 55 is objected to because of the following informalities: On line 10, after “cover” insert a comma. Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. Claims 12, 27, 32-34, 43-48, and 55 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12 depends from claim 11, which was canceled in the amendment of May 1, 2000. Claim 12 will be treated as if it depended from claim 1.

In claim 27, recitation “the covering” lacks antecedent basis and is vague and indefinite.

In claim 32, recitation “said cylindrical rotor” lacks antecedent basis. Presumably this is the “first cylindrical rotor” of claim 29.

In dependent claims 43 and 44, recitations “the cover comprises an insulating layer surrounding the conductor and an outermost layer surrounding the insulating layer, said outermost layer having a conductivity sufficient to establish an equipotential surface around the conductor” (claim 43) and “the cover comprises an inner layer surrounding the conductor and being in electrical contact therewith; an insulating layer surrounding the inner layer and an outermost layer surrounding the insulating layer” (claim 44) are confusing because in independent claim 42, these features belong to the cable, i.e., claim 42 recites a “cable includ[ing] an inner semiconducting layer surrounding the conductor, and being in electrical

Art Unit: 2834

contact therewith, an outermost layer of solid insulation surrounding the inner layer and being in intimate contact therewith, and an outermost layer having semiconducting properties surrounding the insulating layer and being in intimate contact therewith, wherein each inner and outermost layer forms a substantially equipotential surface surrounding the conductor” (claim 42). Independent claim 42 further recites “a winding comprising a cable including at least one current-carrying conductor and a magnetically permeable, electric field confining cover....” Thus, it can be inferred that the cover comprises a part of the whole cable. To recite the same elements as belonging to both the cable and the cover is at best redundant and at worst confusing and indefinite because it is not clear if this means that the elements form part of the combined cable and cover structure, or if both the cable and the cover each comprise these elements. Presumably the former holds, since there is no teaching or drawing showing separate cable and cover elements, each with inner and outer semi-conductive layers, for example.

Similarly, in claim 46, it is not clear if the “plural layers” in recitation “the cover...formed of a plurality of layers” refers to the inner and outer semi-conducting layers forming the cable, or if the plurality of layers are unique to the cover itself.

Claims 45 and 47 are redundant since these features have been recited in claim 42.

In claim 55, recitation “the cover” lacks antecedent basis. Presumably this refers to the “solid insulation coveringing”.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-7, 9, 12-16, 20-26, 28-29, 31 and 38-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (specification pp.1-2 & Figs.1-2) in view of Elton et al. (US 4,853,565). Applicant's admitted prior art teaches a rotating asynchronous high voltage converter or generator for connection to AC networks with equal or different frequencies, wherein the converter comprises a first stator A connected to a first AC network with a first frequency f_i (Fig.2), and a second stator B connected to a second AC network with a second frequency f_o (Fig.2), wherein the converter comprises a rotor (not numbered, with windings 10 & 12; Fig.2) which rotates in dependence of the first and second frequencies f_i and f_o , and wherein at least one of said stators includes at least one winding forming at least one uninterrupted turn (inherent to stators A&B).

The admitted prior art does not teach at least one of the stators with "said winding including a current-carrying conductor and a magnetically permeable, electric field confining insulating covering surrounding the conductor, including an inner layer having semiconducting properties being in electrical contact with the conductor, an insulating layer surrounding the inner layer being in intimate contact therewith, and an outer layer having semiconducting

properties surrounding the insulating layer and being in intimate contact therewith, wherein each layer forms a substantially equipotential surface.”

Elton et al. teaches a high-voltage, electrical cable comprising current-carrying conductors 102 (Fig.7); an inner, semi-conducting “grading” layer 104 made of pyrolyzed glass fibers (c.7, lines 19-20) surrounding and being in electrical contact with the current-carrying conductor 102; a solid insulation layer 106 surrounding and contacting the inner layer; and an outer layer 110 having semi-conducting properties surrounding and contacting the solid insulating layer 106, as well as being in contact with ground, to thus bleed off static charge and thus prohibiting development of corona discharge (c.7, lines 23-28; lines 64-68). In another form, a predetermined reference potential may be coupled to the semi-conducting layer (c.8, lines 13-21).

It would have been obvious to one having ordinary skill to modify applicant’s admitted prior art asynchronous converter and provide a high voltage, electrical cable per Elton et al. with grounded inner and outer semi-conductors separated by an insulator since such a cable would have been desirable to prohibit development of corona discharge.

Regarding claim 2, since the semi-conducting layer in Elton may be classified as an insulator (c.4, lines 4-6), it will necessarily have a similar coefficient of thermal expansion as the surrounding insulator or solid insulation layer 106.

Regarding claim 3, since Elton’s inner semi-conducting layer 104 is in electrical contact with the conductors 102, they are at substantially equal potentials.

Regarding claims 4, Elton teaches that the outer layer 110 is arranged to form substantially an equipotential surface surrounding said conductor 102 (c.7, lines 24-33).

Regarding claims 5-6, in Elton the outer layer 110 is connected to a specific potential, i.e., ground (c.7, lines 26-28).

Regarding claims 7 and 26, in Elton since the inner and outer layers 104 and 110 comprise the same semi-conductive layer, they have substantially equal thermal expansion coefficients.

Regarding claims 9 and 28, in Elton each of said inner and outer layers 104 and 110 is fixedly connected to the adjacent layer of solid insulation 106 along substantially the whole of a connecting surface therebetween (c.3, lines 17-21; Fig.7).

Regarding claims 12 and 31, although neither applicant's prior art nor Elton teach specific cable diameter and cable area ranges, Elton teaches that his invention is applicable to many types of large motors and other electrical devices which would accordingly comprise various sizes of cable and conductor areas. Further, it has been held that where the general conditions of a claim have been met, discovering the optimum or workable ranges involves only routine skill. In re Aller, 10, USPQ 233.

Regarding claim 13, note applicant's admitted prior art Fig.2, showing two electrically and mechanically connected rotors with respective windings 10 and 12, which are concentrically arranged in respect of said stators B and A.

Regarding claims 14 and 29, the prior art discloses the auxiliary device may comprise a variable speed prime mover 14, e.g. a motor (specification p.2, Fig.2).

Regarding claim 15, the prior art teach rotors comprises a low voltage winding 10 or 12. The rotors are rotatable with the frequency $(f_1 - f_2)/2$ and the stator has a current with a

Art Unit: 2834

frequency $(f_1 + f_2)/2$ when said converter is in operation since the stator A is connected to a first AC network and the stator B is connected to a second AC network.

Regarding claim 16, the rotor in applicant's admitted prior art may be considered a single rotor in that the two rotor sections with windings 10 and 12 are mechanically connected and operate as a single unit.

Regarding claim 21, since the semi-conducting layer in Elton may be classified as an insulator (c.4, lines 4-6), it will necessarily have a similar coefficient of thermal expansion as the surrounding insulator or solid insulation layer 106.

Regarding claim 22, since Elton's inner semi-conducting layer 104 is in electrical contact with the conductors 102, they are at substantially equal potentials.

Regarding claim 23, Elton teaches that the outer layer 110 is arranged to form substantially an equipotential surface surrounding said conductor 102 (c.7, lines 24-33).

Regarding claims 24-25, in Elton the outer layer 110 is connected to a specific potential, i.e., ground (c.7, lines 26-28).

Regarding claims 38-41, the prior art teaches use of a rotating asynchronous converter for connection of non-synchronous three phase networks with equal rating frequencies; for connection of three phase networks with different frequencies; as a series compensation in long distance AC transmission; and for reactive power compensation (specification pp.1-2).

7. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (specification pp.1-2 & Figs.1-2) in view of Elton et al. (US 4,853,565) and Laffoon (US 1,891,716). As described above with regard to claim 1, applicant's prior art teaches all the elements of the machine except for details of the semi-conductive and insulating

Art Unit: 2834

layers. Neither does the prior art teach the function of operating the converter at voltages exceeding 36kV.

Elton et al. teaches a high-voltage, electrical cable comprising current-carrying conductors 102 (Fig.7); an inner, semi-conducting “grading” layer 104 made of pyrolized glass fibers (c.7, lines 19-20) surrounding and being in electrical contact with the current-carrying conductor 102; a solid insulation layer 106 surrounding and contacting the inner layer; and an outer layer 110 having semi-conducting properties surrounding and contacting the solid insulating layer 106, as well as being in contact with ground, to thus bleed off static charge and thus prohibiting development of corona discharge (c.7, lines 23-28; lines 64-68). In another form, a predetermined reference potential may be coupled to the semi-conducting layer (c.8, lines 13-21).

It would have been obvious to one having ordinary skill to modify applicant’s admitted prior art asynchronous converter and provide a high voltage, electrical cable per Elton et al. with grounded inner and outer semi-conductive gradings separated by an insulator since such a cable would have been desirable to prohibit development of corona discharge. As evidence that such a grading structure would inherently be capable of operating at voltages exceeding 36 kV, Laffoon teaches a winding for a dynamo-electric machine comprising a “voltage gradient equalizer” strips 10 comprising fiber or mica which create an equipotential surface about conductors 4 (Figs.1&4) at high voltages such as 33 kV or 66kV, so that the machines may be directly connected to the network on normal distribution voltages (p.1, lines 39-50).

Double Patenting

8. Claims 42-52 and 54 of this application conflict with claims 32, 34, 38, 45, 61, 64 and 67-69 of Application No. 10/603,802 (as amended 13 November 2003). 37 CFR 1.78(b) provides that when two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application. Applicant is required to either cancel the conflicting claims from all but one application or maintain a clear line of demarcation between the applications. See MPEP § 822.

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 42-52 and 54 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 32, 34, 38, 45, 61, 64 and 67-69 of copending Application No. 10/603,802 (the '802 application). Although the conflicting claims are not identical, they are not patentably distinct from each other because independent claims 32 and 61 of the '802 application reads on a generic "high-voltage rotating electric machine", and the recitation in claim 42 of a "rotating synchronous converter

Art Unit: 2834

employing a high voltage electric machine” is a species thereof. Further, the “inner” and “outer” semiconducting layers in claims 32 and 61 of the ‘802 application read on the feature in claim 42 of “a magnetically permeable, field confining cover” since the inner and outer layers inherently form a cover about the conductor, and the semiconductive layers are inherently magnetically permeable and confine the field.

Regarding claim 43, see claims 34 or 61 of the ‘802 application.

Regarding claim 44-45, these features are claimed in claim 32 of the ‘802 application.

Regarding claim 46, see claim 64 of the ‘802 application.

Regarding claim 47, see claims 32 or 61 of the ‘802 application.

Regarding claim 48, see claims 38 or 61 of the ‘802 application.

Regarding claim 49, see claim 45 of the ‘802 application.

Regarding claim 50, see claim 67 of the ‘802 application.

Regarding claim 51, see claim 68 of the ‘802 application.

Regarding claim 52, see claim 69 of the ‘802 application.

Regarding claim 54, see claim 61 of the ‘802 application.

Allowable Subject Matter

11. Regarding claims 8 and 27, the prior art does not teach that the current-carrying conductor “comprises at least one of a plurality of insulated conductive elements and at least one uninsulated conductive element”.

The prior art, in particular Elton ‘565, Fig.7, shows an embodiment including a conductor comprising plural strands 102; however, there is no teaching that the strands

Art Unit: 2834

comprise at least one of both insulated and uninsulated strands. Elton '165 teaches an identical arrangement (Fig. 1) with the semi-conductive internal 104 grading layer or "cover" 110 "in electrical contact" with the conductor 102 (c.2, lines 67-68), from which it can be deduced that there exists "at least one uninsulated conductive strand in contact with the cover", since an insulated conductive strand would not permit conduction between the strand and the cover.

However, there is no teaching or suggestion to combine at least one of both insulated and uninsulated strands in the conductor 102. In particular, Takaoka, US 5,094,703 teaches an electrical power cable comprising plural copper strands 5 at least one of which is insulated with a cupric oxide insulation film 7 of thickness 0.3 to 3 μ m (c.2, lines 42-44; Figs.3&5).

However, there is no motivation to combine Takaoka with the prior art and Elton because Takaoka's "electrical power cable" is a *power transmission cable* and is not disclosed as being used for windings or coils in a rotating asynchronous converters or similar dynamo-electric machine. Also, Takaoka is directed towards the "skin-effect" problem, not to the equalization of the potential between conductor and an inner semi-conductive layer as in applicant's invention. Finally, the examiner also notes that some embodiments in Takaoka, e.g. Fig. 8, include oxidized (insulated) outer strands 9₂, so that even if combinable with Elton, these embodiments in Takaoka would not be suggestive of electrical contact between the outer insulated strands 9₂ and the inner semi-conductive covering or layer 104 of Elton.

Breitenbach disclose a stranded conductor 5 comprising individual wires 5; however, there is no teaching of both insulated and uninsulated conductors.

12. Claims 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim

Art Unit: 2834

and any intervening claims. The prior art does not teach that the rotor comprises “loops of cable...connected to each other and...arranged opposite each other on said rotor and separated by two sectors, wherein each sector has an angular width of a.”

13. Claims 32-34 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. Regarding claim 32, the prior art does not teach that “said rotor means comprises two electrically and mechanically connected hollow rotors [68₁ and 68₂] arranged concentrically around said stator [62] and said [first] cylindrical rotor [64]” as seen in Fig.6 of applicant’s specification.

14. Claims 35-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Regarding claim 35, the prior art does not teach that “said rotor means comprises a first rotor and a second rotor...wherein said first rotor [78₁] is hollow and arranged concentrically around said first cylindrical rotor [74], and said second rotor [78₂] is cylindrical” as seen in Fig.7 of applicant’s specification.

15. Claims 42 and 49-52 and 54 are provisionally rejected under non-statutory obviousness double-patenting. If overcome, claim 42 would be allowable because the prior art does not teach the claimed rotating asynchronous converter including, inter alia, “said conductor including a plurality of insulated conductive strands and at least one uninsulated conductive strand in contact with the cover”. See the reasons give above with regard to claim 8.

16. Independent claim 55 would also be allowable pending amendment to correct the objection noted above. For the same reasons as given for claim 8 above, the prior art does not

Art Unit: 2834

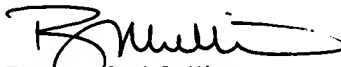
teach the rotating asynchronous converter of claim 55 including, inter alia "said conductor including at least one of a plurality of insulated conductive elements and at least one uninsulated conductive element in contact with the cover[ing], said cable comprising an inner semiconducting layer surrounding the conductor, and being in electrical contact therewith."

Conclusion

17. The applicant is reminded that given the large number of pending "Enkel" cases, further double-patenting rejections may be appropriate during prosecution. The claims in this application have been checked for double patenting only against claims in the 10/603,802 application.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Burton S. Mullins whose telephone number is 305-7063. The examiner can normally be reached on Monday-Friday, 9 am to 5 pm. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-0956.


Burton S. Mullins
Primary Examiner
Art Unit 2834

bsm
23 January 2003